Administrative Data Research Centre Scotland

THE UNIVERSITY of EDINBURGH | Centre for Cognitive Ageing and Cognitive Epidemiology

Childhood cognitive function and later-life economic activity

Linking the Scottish Mental Survey 1947 to administrative data

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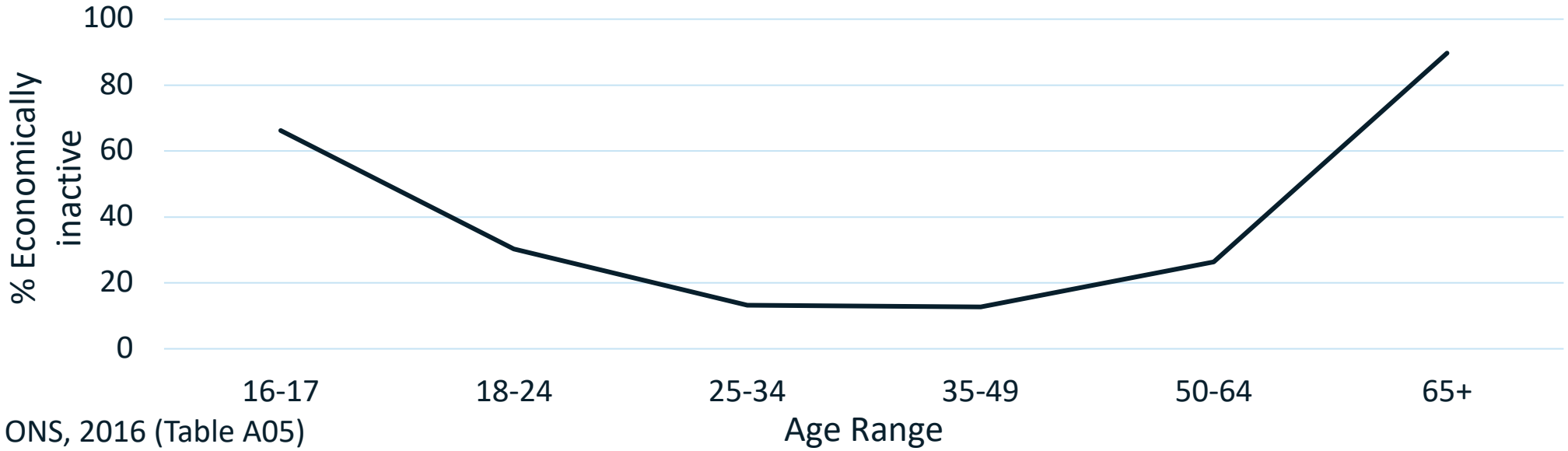
Economic activity in later-life

- As the population ages, individuals are expected to work for longer.



ONS, 2016 (Table A05)

  - Decline in cognitive and physical function (Deary et al., 2006)
  - Changing workplace and technology (Sterns & Dawson, 2012)
- **What factors predict the ability to remain economically active in later life?**

Previous work

- Primarily focussed on predicting mid-life economic activity
  - Childhood socioeconomic status (Anyadike-Danes & McVicar, 2005)
  - Childhood cognitive ability (Fergusson et al., 2005)
- 'Long arm' of early-life factors indicates role in:
  - Capacity - Human Capital (Kanfer et al., 2001)
  - Resilience - Cognitive Reserve (Stern, 2009)
- Mediation between early-life factors (Deary et al., 2005).
  - Importance of Education (Richards & Sacker, 2003)

The Present Study

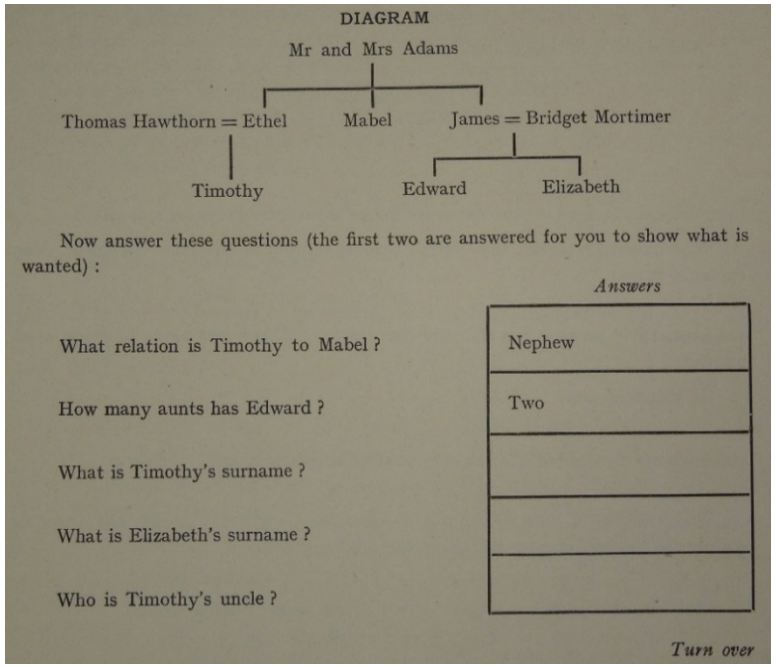
- Extend previous work to predict odds of economic activity in later life, around retirement age (55+).
- Examine structure between early-life factors and their association with the odds of economic activity.

- **Hypothesis:** Those with higher childhood SES, childhood cognitive ability and education will be:
  - More likely to be economically active at age 55
  - Less likely to become inactive over time.

The Scottish Mental Survey 1947

Almost all (94%) 11-year-old children attending a Scottish school on the 4th June 1947 took part in the Scottish Mental Survey 1947.

- Moray House Test No. 12 (General cognitive ability):
  - Same–opposites
  - Analogies
  - Reasoning
  - Proverbs
  - Arithmetic
  - Spatial items
  - Cypher decoding



DIAGRAM

Mr and Mrs Adams

Thomas Hawthorn = Ethel | Mabel | James = Bridget Mortimer

Timothy | Edward | Elizabeth

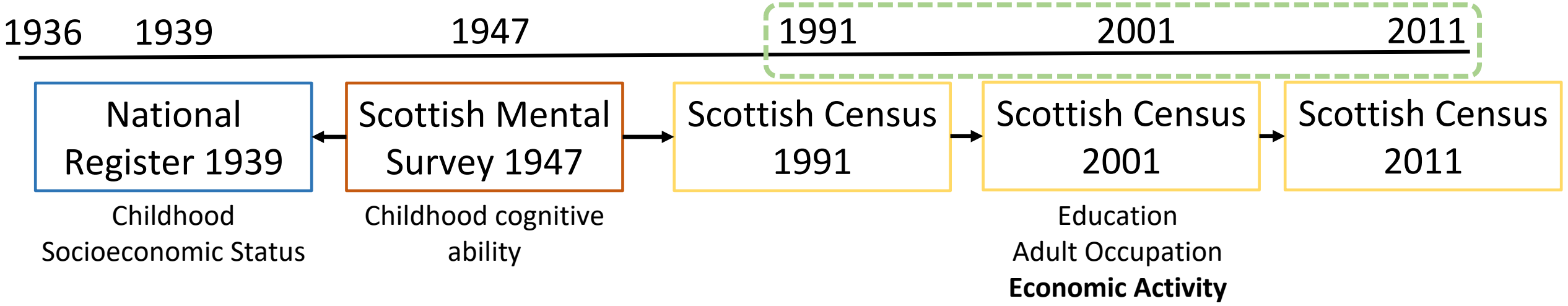
Now answer these questions (the first two are answered for you to show what is wanted) :

	Answers
What relation is Timothy to Mabel ?	Nephew
How many aunts has Edward ?	Two
What is Timothy's surname ?	
What is Elizabeth's surname ?	
Who is Timothy's uncle ?	

Turn over

- Rare and valuable availability of early-life cognitive ability

Sample



- SMS1947 participants included in the Scottish Longitudinal Study
  - The SLS is a standing database of linked administrative data from 5.3% of the Scottish Population, selected from 20 dates of birth.

- N = Anonymised records of 2374 individuals

Analyses

Predictors	**Outcomes**
Highest Household HISCAM scores (Childhood SES) Moray House Test scores (Childhood cognitive ability) Highest Qualification (Education)	Economic Activity vs. Inactivity (1991 > 2001 > 2011)

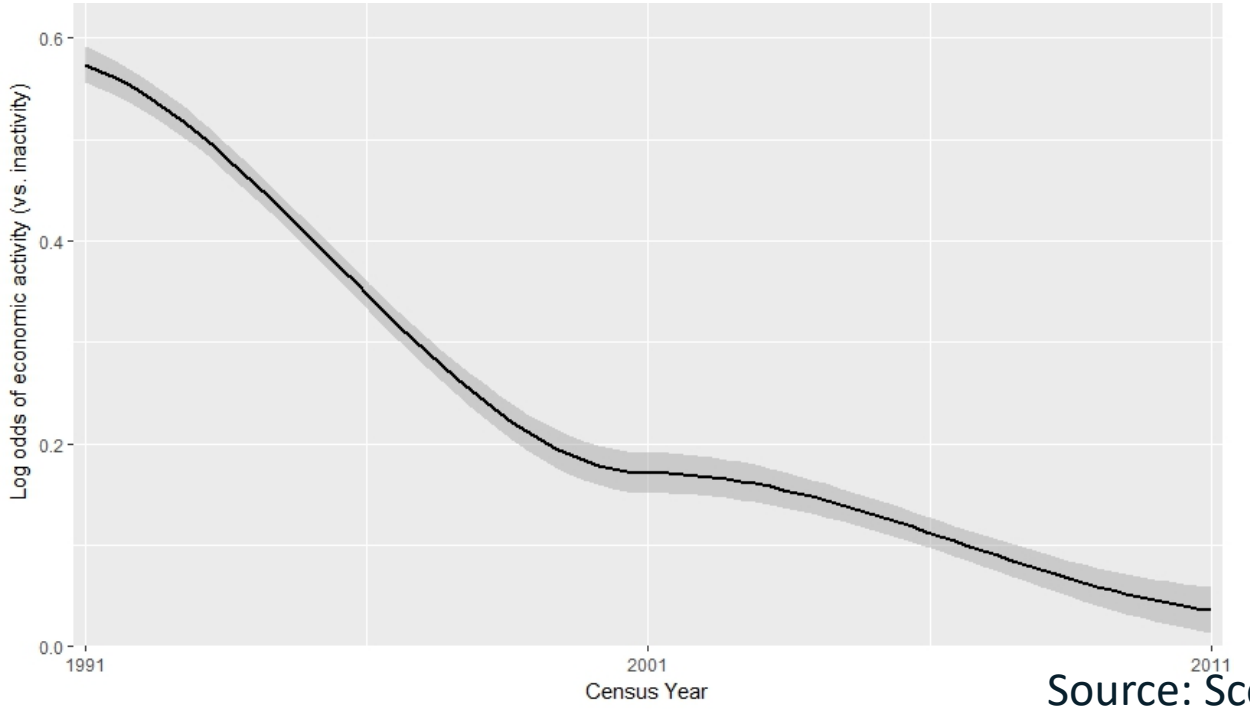
Source: Scottish Longitudinal Study

- Latent growth curve model for odds of being economically active at 1991, and odds of subsequent change across a 20-year period.
- Separate models for economic activity in Males/Females
  - Males: N = 1153
  - Females: N = 1221
- Assess moderation by adult SES (NSSEC 3-class)

Economic activity over time

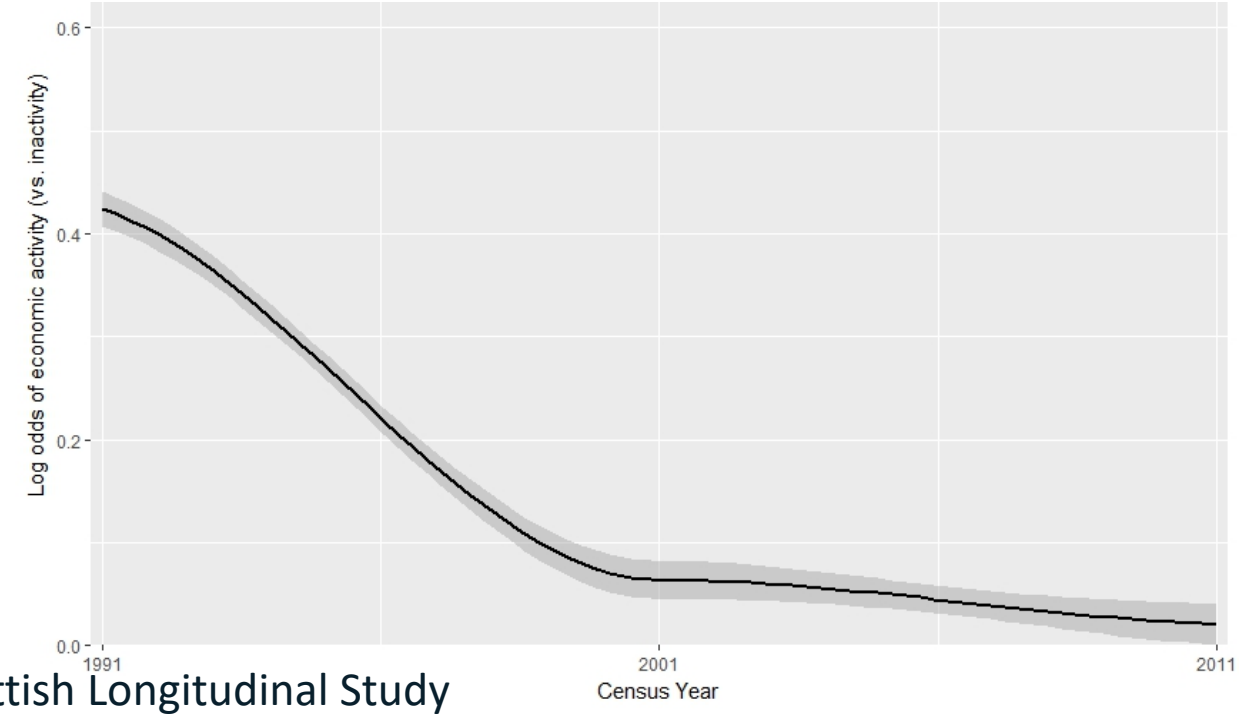
Males

Frequency Rank	%	Economically Active at age 55	Economically Active at age 65	Economically Active at age 75
1	33	1	0	0
3	13	1	1	0
6	6	0	0	0
10	2	1	1	1



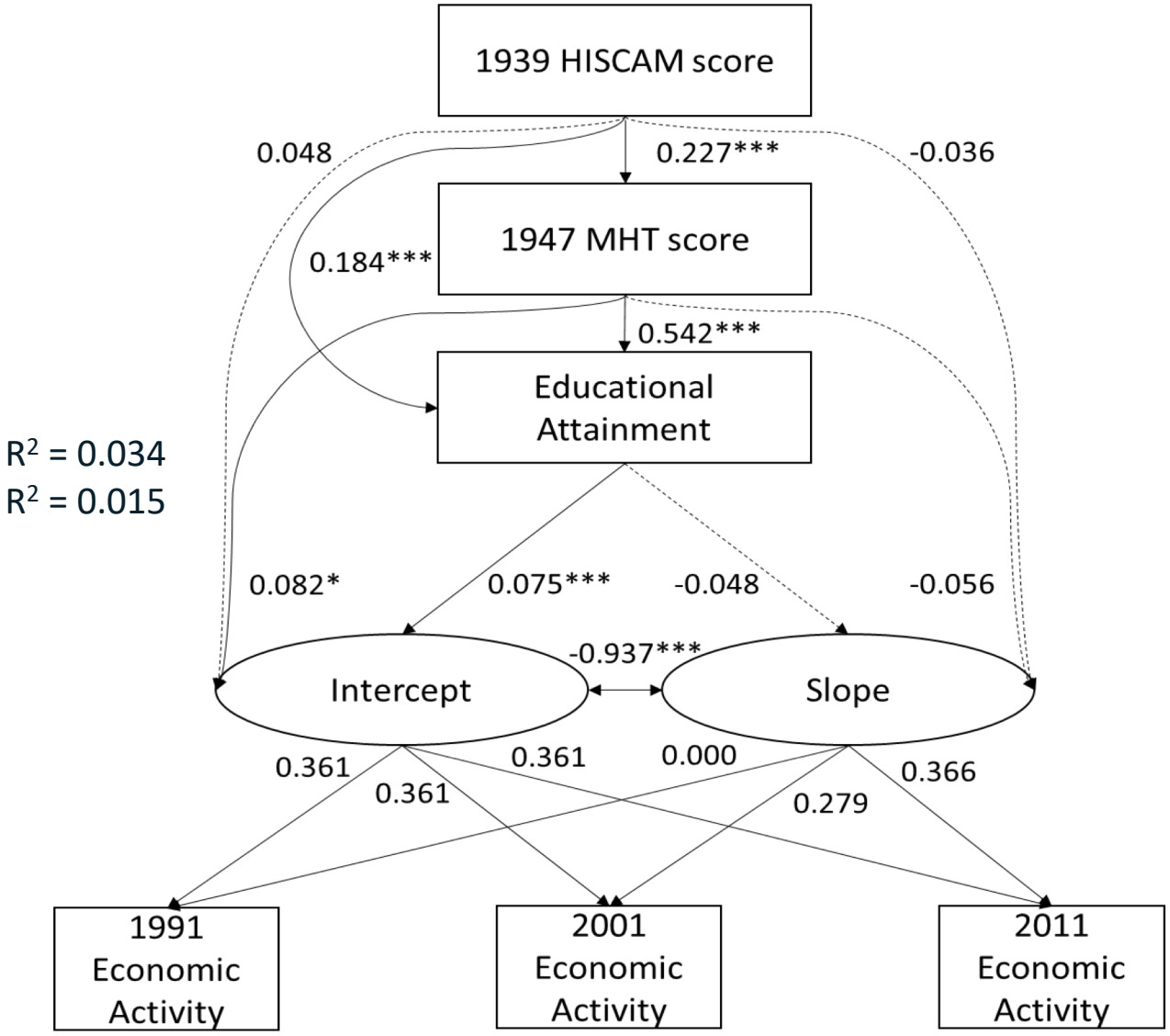
Females

Frequency Rank	%	Economically Active at age 55	Economically Active at age 65	Economically Active at age 75
1	33	1	0	0
2	21	0	0	0
7	5	1	1	0
11 (Other)	2			



Source: Scottish Longitudinal Study

Males

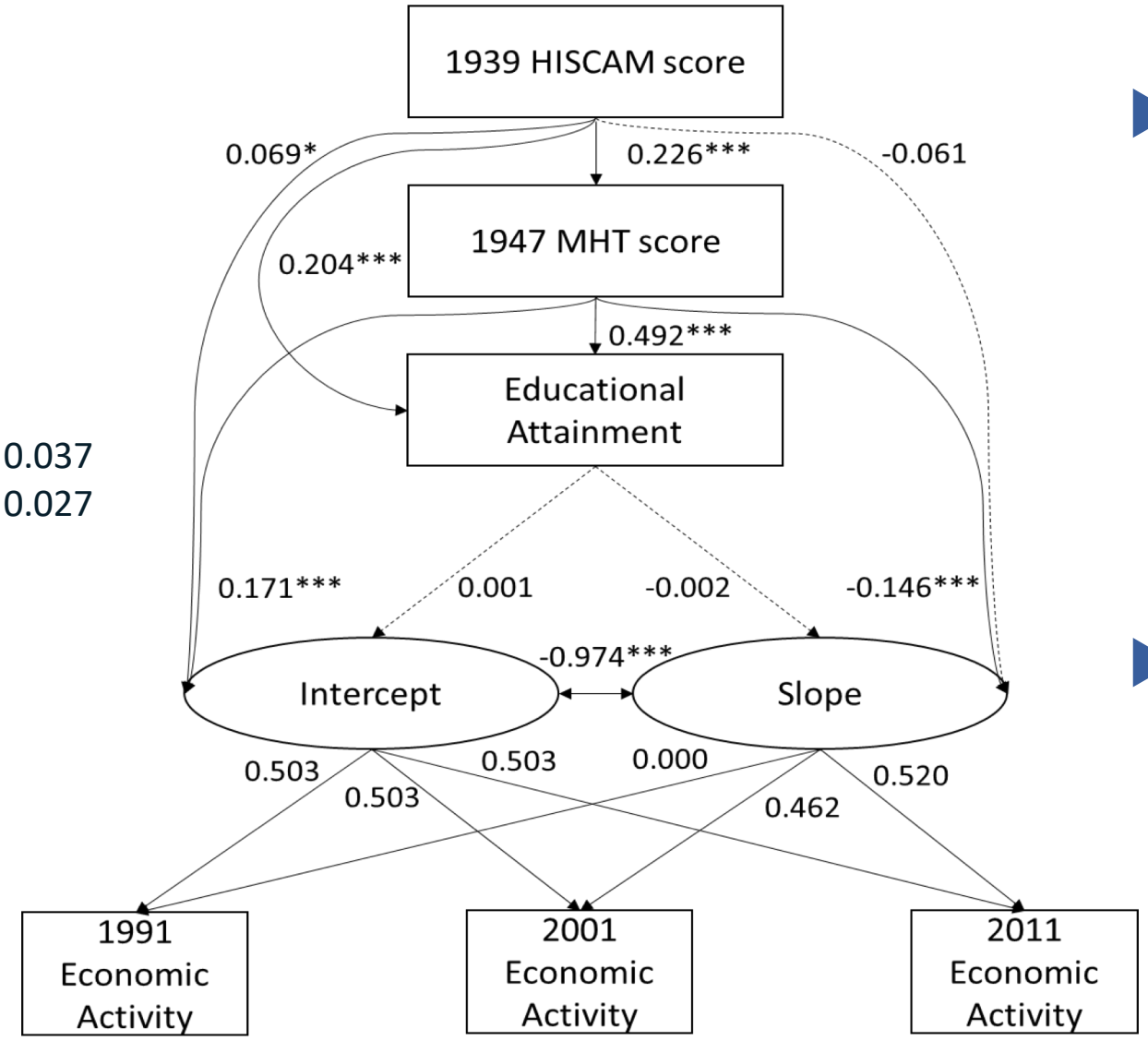


Odds Ratios

- *Intercept – odds of activity at 1991*
  - 1947 MHT score = 1.045***
    - **Direct**, and Partly mediated by **Education**
    - Not moderated by NSSEC class
  - Educational Attainment = 1.027***
    - **Direct**
    - Not moderated by NSSEC class
- *Slope – odds of becoming inactive*
  - 1947 MHT score = 0.977*
    - Direct and Mediated effects not significant

Source: Scottish Longitudinal Study

Females



Odds Ratios

- *Intercept – odds of activity at 1991*
  - 1939 HISCAM score = 1.036*
    - **Direct**, and Partly mediated by **MHT score**
    - Not moderated by NSSEC class
  - 1947 MHT score = 1.090***
    - **Direct**
    - Not moderated by NSSEC class
- *Slope – odds of becoming inactive*
  - 1947 MHT score = 0.934***
    - **Direct**
    - Not moderated by NSSEC class

Source: Scottish Longitudinal Study

Summary

- Temporally-ordered association between life-course predictors – direct and mediated
- No moderation by adult occupation suggests no compensation for early-life disadvantage

Odds of economic activity at age 55:

- Higher childhood cognitive ability predicted higher odds for both males and females
  - Role in building human capital
- Sex-specific effects:
  - Males: Higher **educational attainment** predicted higher odds of being economically active
  - Females: Higher **childhood SES** predicted higher odds of being economically active; Stronger contributions of **childhood cognitive ability**
  - Historic inequalities in access to education etc.

Odds of becoming inactive from ages 55-75:

- Rapid decrease in odds of being active between ages 55 and 65
  - Effect of statutory retirement age and pension policy
- Few or weak contributions from life-course predictors
  - Importance of proximal factors such as finances and health as driving inactivity

Thanks!

Collaborators

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Descriptives

	Male (N = 1153)			Female (N = 1221)		
	Mean	SD	N non-response	Mean	SD	N non-response
Age 3 HISCAM score (max = 99)	47.27	10.15	254	47.57	10.33	251
Age 11 MHT score (max = 76)	35.46	16.09	63	37.67	14.54	81
Life-course Educational attainment (N) None/Level 1/Level 2/Level 3/Level 4 – Professional/Level 4 -Degree	722/166/86/43/72/49		15	773/213/79/30/84/23		19
Age 55 NSSEC Class (N) Routine/Intermediate/Higher	566/188/276		123	483/264/129		345
Age 55 Log odds of being economically active	0.57	0.27	0	0.42	0.34	0
Age 65 Log odds of being economically active	0.16	0.30	274	0.07	0.20	241
Age 75 Log odds of being economically active	0.04	0.15	466	0.02	0.12	374

Source: Scottish Longitudinal Study